DETAILED ACTION

Response to Arguments

1. The applicant filed a terminal disclaimer to overcome the double patent rejection set forth in the previous office action. The TD has been approved.

2. Upon additional search the examiner determined that terminal disclaimers needed to be filed against the following patents: 6944302, 6282296 and 6122385. The examiner contacted the applicant's representative to see if the applicant would go ahead and file the terminal disclaimers so that we can complete prosecution on this case. The examiner did not hear back from the applicant's representative.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-11 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No 6,282,296, claims 1-15 of U.S. Patent No 6,122,385 and claims 1-8 of U.S. Patent No 6,944,302.. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed subject matter is similar in scope.

09786990	6,122,385	6,282,296	6,944,302
1. (Currently Amended) A sound reproduction apparatus comprising: a power amplifier for amplifying input signal; a speaker unit for reproducing output signal of the power amplifier, said	What is claimed is: 1. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a	1. An audio reproducing apparatus comprising: (a) a power amplifier; (b) a speaker unit which reproduces output signals from said power	1. A sound reproducing apparatus comprising: a variable gain amplifier; a loudspeaker unit having a diaphragm, for reproducing an output of said power amplifier; a loudspeaker box for

speaker unit being mounted on a baffle; a first microphone provided outside a dust cap of said speaker unit; a second microphone provided inside the dust cap of said speaker unit; a first filter that receives output signal of said first microphone containing ambient noise and reproduced signal of said speaker unit, and outputs a signal of certain specific pass band; a second filter that receives output signal of said second microphone, and outputs a signal of certain specific pass band; an adder for adding output signals from said first filter and said second filter; conversion means for converting AC signal from said adder into DC signal; and control means provided at an input stage of said power amplifier, said control means automatically	positive input terminal coupled to said input terminal and a negative input terminal for receiving another signal; a power amplifying means for amplifying an input signal supplied from said subtracting means; a speaker for reproducing a sound signal from an output signal of said power amplifying means; a closed box for enclosing said speaker; a microphone for detecting the sound signal radiated from said speaker; a microphone amplifying means for amplifying the sound signal detected by said microphone; a filtering means for processing an output signal of said microphone amplifying means; and a summing means	amplifier, said speaker unit having a minimum resonance frequency; (c) a first microphone; (d) a second microphone; (e) a low pass filter coupled to said first microphone, said low pass filter having a first cut-off frequency which is based on said minimum resonance frequency of said speaker unit; (f) a high pass filter coupled to said second microphone, said high pass filter having a second cut-off frequency which is based on said minimum resonance frequency of said speaker unit; (g) an adder for adding an output from said low pass filter and an output from said high pass filter to obtain an adder result; (h) a variable gain circuit providing an output signal to an	accommodating said loudspeaker; a microphone located near said loudspeaker box for capturing a mixed sound including a sound radiated from said loudspeaker unit and a noise around said loudspeaker box; a detector for detecting a physical quantity varying according to a motion of said diaphragm; a combining section for combining an output of said microphone and an output of said detector; and a comparing section for comparing an integral value obtained by integrating an output of said combining section and an integral value obtained by integrating an output of said variable gain amplifier, and for outputting a control signal for controlling said variable gain amplifier so that said integral values are equal to each other.

controlling the strength of said input signal in accordance with DC signal delivered from said conversion means so that the sound reproduced by said speaker unit is not masked by ambient noise around said speaker unit. 2. (Currently Amended) The sound reproduction apparatus of claim 1, wherein said first filter is a primary low-pass filter. 3. (Currently Amended) The sound reproduction apparatus recited in claim 1, wherein said second filter is a primary high-pass filter. 4. (Currently Amended) The sound reproduction apparatus of claim 1, wherein said first microphone is attached and fixed on an outer surface of the dust cap. 5. (Currently Amended) The sound reproduction apparatus of claim 1, wherein said second microphone is attached and	for adding an output signal of said filtering means to the input signal of said power amplifying means; wherein an output signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop; and wherein a second order high-pass filter having a cut-off frequency same as the lowest resonant frequency of said speaker is used as said filtering means. 2. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a positive input terminal coupled to said input terminal and a negative input terminal for receiving another	input side of said power amplifier, said output signal being varied responsive to said adder result. 2. An audio reproducing apparatus according to claim 1, wherein said low pass filter passes frequencies which are at least partially cut off by said high pass filter, said high pass filter passes frequencies which are at least partially cut off by said low pass filter. 3. An audio reproducing apparatus according to claim 1, wherein said speaker unit is included in a speaker box. 4. An audio reproducing apparatus according to claim 3, wherein said first microphone is disposed outside said speaker box and said second microphone is disposed inside said speaker box. 5. An audio reproducing	2. The sound reproducing apparatus of claim 1, wherein said combining section includes: a first compensation circuit for receiving an output of said microphone; a second compensation circuit for receiving an output of said detector; and an operational amplifier for receiving an output of said first compensation circuit and an output of said second compensation circuit, and wherein a difference between a gain to frequencies of a component of said sound radiated from said loudspeaker unit included in said output of said first compensation circuit and a gain to frequencies of an output of said second compensation circuit is constant, and said component of said sound and said output of said second correction circuit have phases reverse to each

fixed on an inner surface of the dust cap. 6. (Currently Amended) The sound reproduction apparatus of claim 1, wherein said first microphone is disposed so as to oppose the dust cap with a certain predetermined clearance. 7. (Currently Amended) The sound reproduction apparatus of claim 1, wherein said second microphone is disposed so as to oppose opposing to the dust cap with a certain predetermined clearance. 8. (Currently Amended) The sound reproduction apparatus of claim 1, wherein said first microphone and said second microphone are disposed on an axial the axial line of the dust cap opposing face to face with the dust cap in the middle. 9. (Currently Amended) The sound reproduction	signal; a power amplifying means for amplifying an input signal supplied from said subtracting means; a speaker for reproducing a sound signal from an output signal of said power amplifying means; a closed box for enclosing said speaker; a microphone for detecting the sound signal radiated from said speaker; a microphone amplifying means for amplifying the sound signal detected by said microphone; a filtering means for processing an output signal of said microphone amplifying means; and a summing means for adding an output signal of said filtering means to the input signal of said power amplifying means;	apparatus according to claim 1, further comprising an AC/DC converter for converting said adder result to a DC output signal, wherein said DC output signal is provided to said variable gain circuit to vary said output signal of said variable gain circuit. 6. An audio reproducing apparatus according to claim 3, wherein said first microphone is disposed in front of the speaker unit and said second microphone is disposed behind the speaker unit. 7. An audio reproducing apparatus according to claim 5, wherein said AC/DC converter is a rectifier. 8. An audio reproducing apparatus according to claim 1, wherein said audio reproducing apparatus is situated in a moving vehicle.	other. 3. The sound reproducing apparatus of claim 1, wherein said detector including a further microphone. 4. The sound reproducing apparatus of claim 1, wherein said loudspeaker unit includes: a voice coil; and a bobbin on which said voice coil is wound, and wherein said detector including a detection coil located at said bobbin. 5. The sound reproducing apparatus of any one of claims 1, wherein said comparing section includes: a first amplifier for amplifying an output of said combining section; a first absolute value circuit for outputting an absolute value of an output of said first amplifier; circuit; a second absolute value circuit for outputting an absolute value of an output of said

apparatus of claim 1, wherein said conversion means is a rectifier circuit. 10. (Currently Amended) The sound reproduction apparatus of claim 1, wherein said control means is a variable gain controller which controls an amplification degree of the input signal in accordance with the DC signal delivered from said conversion means. 11. Currently Amended) The sound reproduction apparatus recited in claim 2, wherein said second filter is a primary high-pass filter.	wherein an output signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop; and wherein a second order high-pass filter having a cut-off frequency higher than the lowest resonant frequency of said speaker is used as said filtering means. 3. The filter according to claim 2, wherein the cut-off frequency of said filter is set at about 400 Hz. 4. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a positive input terminal coupled to said input terminal and a negative input terminal for receiving another signal;		variable gain amplifier; a second integrator for integrating an output of said second absolute value circuit; an adder for adding an output of said first integrator to an output of said second integrator; and a second amplifier for amplifying an output of said adder. 6. The sound reproducing apparatus of claim 5, wherein said first absolute value circuit is of a normal type, and said second absolute value circuit is of an inverted type. 7. The sound reproducing apparatus of claim 5, wherein said first absolute value circuit is an inverted type absolute value circuit, and said second absolute value circuit is a normal type absolute value circuit. 8. The sound reproducing apparatus of claim

	a power amplifying means for amplifying an input signal supplied from said subtracting means; a speaker for reproducing a sound signal from an output signal of said power amplifying means; a closed box for enclosing said speaker; a microphone for detecting the sound signal radiated from said speaker; a microphone amplifying means for amplifying the sound signal detected by said microphone; a filtering means for processing an output signal of said microphone amplifying means; and a summing means for adding an output signal of said filtering means to the input signal of said power amplifying means; wherein an output		5, further comprising a third compensation circuit disposed between said variable gain amplifier and said second absolute value circuit, said third compensation circuit having a gain-frequency characteristic substantially identical to a gain-frequency characteristic for said radiated sound totally through said microphone, said detector, said operational amplifier, and said first amplifier.

	signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop; and wherein a first order high-pass filter having a cut-off frequency same as the lowest resonant frequency of said speaker is used as said filtering means. 5. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a positive input terminal coupled to said input terminal and a negative input terminal for receiving another signal; a power amplifying means for amplifying an input signal supplied from said subtracting means; a speaker for reproducing a		

	sound signal from an output signal of said power amplifying means; a closed box for enclosing said speaker; a microphone for detecting the sound signal radiated from said speaker; a microphone amplifying means for amplifying the sound signal detected by said microphone; a filtering means for processing an output signal of said microphone amplifying means; and a summing means for adding an output signal of said filtering means to the input signal of said power amplifying means; wherein an output signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop; and		

	wherein a first order high-pass filter having a cut-off frequency higher than the lowest resonant frequency of said speaker is used as said filtering means. 6. The filter according to claim 5, wherein the cut-off frequency of said filter is set at about 1 kHz. 7. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a positive input terminal coupled to said input terminal and a negative input terminal for receiving another signal; a power amplifying means for amplifying an input signal supplied from said subtracting means; a speaker for reproducing a		

	sound signal from an output signal of said power amplifying means; a microphone for detecting the sound signal radiated from said speaker; a filtering means for processing an output signal of said microphone; and a summing means for adding an output signal of said filtering means to the input signal of said power amplifying means; wherein an output signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop. 8. The sound reproduction apparatus according to claim 7, wherein an electret capacitor microphone is used as said microphone and is located near a microphone amplifying means.		

	9. The sound reproduction apparatus according to claim 8, wherein said microphone is mounted on a printed circuit board together with said subtracting means, said power amplifying means, said microphone amplifying means, said filtering means and said summing means, and wherein said microphone and said microphone amplifying means are separated by a short distance from each other. 10. The sound reproduction apparatus according to claim 7, wherein said microphone is mounted on a printed circuit board together with said subtracting means, said power amplifying means, a microphone amplifying means, said filtering means and said summing		

	means, and wherein said microphone and said microphone amplifying means are separated by a short distance from each other. 11. The sound reproduction apparatus according to claim 7, wherein said microphone is located within a closed box together with said speaker. 12. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a positive input terminal coupled to said input terminal and a negative input terminal for receiving another signal; a power amplifying means for amplifying an input signal supplied from said subtracting means;		

	a speaker for reproducing a sound signal from an output signal of said power amplifying means; a closed box for enclosing said speaker; a microphone for detecting the sound signal radiated from said speaker; a microphone amplifying means for amplifying the sound signal detected by said microphone; a high-pass filter for compensating the phase of an output signal of said microphone amplifying means; wherein the phase-shift of the output signal of said microphone amplifying means is kept from +90.degree. to -90.degree.; and a summing means for adding an output signal of said filter to the input signal of said power amplifying means;		

	wherein an output signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop. 13. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a positive input terminal coupled to said input terminal and a negative input terminal for receiving another signal; a power amplifying means for amplifying an input signal supplied from said subtracting means; a speaker for reproducing a sound signal from an output signal of said power amplifying means; a closed box for enclosing said		

	speaker; a microphone for detecting the sound signal radiated from said speaker; a microphone amplifying means for amplifying the sound signal detected by said microphone; a filtering means for processing an output signal of said microphone amplifying means; and a summing means for adding an output signal of said filtering means to the input signal of said power amplifying means; wherein the output signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop; and wherein an electret capacitor microphone is used as said microphone and is located in said closed box near said		

	microphone amplifying means. 14. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a positive input terminal coupled to said input terminal and a negative input terminal for receiving another signal; a power amplifying means for amplifying an input signal supplied from said subtracting means; a speaker for reproducing a sound signal from an output signal of said power amplifying means; a closed box for enclosing said speaker; a microphone for detecting the sound signal radiated from said speaker; a microphone		

	amplifying means for amplifying the sound signal detected by said microphone; a filtering means for processing an output signal of said microphone amplifying means; and a summing means for adding an output signal of said filtering means to the input signal of said power amplifying means; wherein the output signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop; wherein said microphone is mounted in said closed box on a printed circuit board together with said subtracting means, said power amplifying means, said microphone amplifying means, said filtering means and said summing means; and		

	wherein said microphone and said microphone amplifying means are separated by a short distance from each other. 15. A sound reproduction apparatus comprising: an input terminal for receiving input signals; a subtracting means having a positive input terminal coupled to said input terminal and a negative input terminal for receiving another signal; a power amplifying means for amplifying an input signal supplied from said subtracting means; a speaker for reproducing a sound signal from an output signal of said power amplifying means; a closed box for enclosing said speaker; a microphone for		

	detecting the sound signal radiated from said speaker; a microphone amplifying means for amplifying the sound signal detected by said microphone; a filtering means for processing an output signal of said microphone amplifying means; and a summing means for adding an output signal of said filtering means to the input signal of said power amplifying means; wherein an output signal of said summing means is supplied to said negative input terminal as said other signal in order to form a negative feedback loop; and wherein said microphone is located within said closed box together with said speaker.		

Allowable Subject Matter

5. Claims 1-11 would be allowable once the office terminal disclaimers have been filed and approved.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVONA E. FAULK whose telephone number is (571)272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devona E. Faulk/
Primary Examiner, Art Unit 2614